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Technology management through intellectual property rights†

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In this article, intellectual property (IP), its various types and the rights of patentee are defined. Challenges for Indian IP professionals at academia and IP firms are also identified. India's preparedness in IP matters is almost pathetic, which has further been compounded by factors such as excessive filing by non-Indian entities, the myths Indian entities (IEs) are shrouded in and strategy by non-practising entities. Role of Indian academia in preparing the IP ambience has been highlighted. IEs have been advised to adopt correct IP practices.

The preparedness of IEs in the IP matters has been analysed and the gap areas have been identified. Need for a fully functional IP Cell at IE has been established. Such an IP Cell will provide the required support to the inventors and help IE handle its IP obligations. Technology Transfer Office can be a possibility after successful operation of IP Cell at IE.

Keywords: Academia, intellectual property, IP cell, non-Indian entities, technology management.

TECHNOLOGY management is related to issues such as creation of technology as well as its management with a view to generate revenue. Technology creation is again associated with the process of invention as well as innovation. Invention need not happen within the walls of the laboratories only. Similarly, innovation need not be related to the process of commercialization only. Technology comprises of at least three important intellectual property (IP) types (out of patents, trademarks, designs, copyrights and trade secrets) and understanding with respect to their creation is an important aspect. Creation of technology in Indian entities (IEs) is often in the hands of inexperienced people who lack adequate understanding and skills to handle them. Technology management is rightly concerned with the management of intellectual capital.

IP refers to creations of the mind: inventions, literary and artistic works and symbols, names, images and designs used in commerce. IP is divided into two categories: industrial property, which includes patents, utility models, trademarks, industrial designs and geographical indications of source; and copyright, which includes literary and artistic works such as novels, poems and plays, films, musical works, artistic works such as drawings, paintings, photographs and sculptures, and architectural designs. Rights related to copyright include those of performing artists in their performances, producers of phonograms in their recordings, and those of broadcasters in their radio/television programmes. The innovations and creative expressions of indigenous and local communities are also IP yet because they are 'traditional' they may not be fully protected by existing IP systems. Access to, and equitable benefit-sharing in, genetic resources also raise IP questions. IP is thus an intellectual creation existing in many forms such as copyrights, trademarks, patents, designs, etc. State grants the monopoly rights to the creators in lieu of their full disclosure[1,2].

In case of a patented product, the patentee shall have the exclusive right to prevent third parties from the act of making, using, offering for sale, selling or importing for those purposes that product in India. In case of a patented process, the patentee shall have the exclusive right to prevent third parties from the act of using that process and from the act of using, offering for sale, selling or importing for those purposes the product obtained directly by that process in India[3]. These rights are territorial in nature. For example, if a patentee has been granted the rights in India, he can exercise such rights in India only. A patentee on the strength of his US patent cannot exercise such rights in India. In order to exercise such rights in territories other than India, the patentee has to acquire such rights in the jurisdictions required for the purpose.

Annual Report 2011–12 published by the office of the Controller General of Patents, Designs, Trade Marks (CGPTM) and Geographical Indicators, India has provided status on different kinds of IP with respect to their filing, prosecution and usage by different entities. For the purpose of this article, we shall primarily focus on patents only. Trends in other forms of IP are similar. For example, the data on filing of patent applications in past 20 years (Table 1) is worth analysing[4,5].

†Views expressed herein are not necessarily shared by the organizations where the author has worked in the past.

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Table 1. Data on filing of patent applications during 1992–2012 at Indian Patent Office

Year	Indian entities	Non-Indian entities			Total	Percentage of filing by Indian entities
		Ordinary	Convention	National phase applications under PCT		
1992–93	1,228		2,239		3,467	35.42
1993–94	1,266		2,603		3,869	32.72
1994–95	1,741		3,589		5,330	32.66
1995–96	1,606		5,430		7,036	22.83
1996–97	1,661		6,901		8,562	19.40
1997–98	1,926		8,229		10,155	18.97
1998–99	2,247		6,707		8,954	25.09
1999–2000	2,206		2,349	269	4,824	45.73
2000–01	2,179		2,160	4,164	8,503	25.63
2001–02	2,371		1,870	6,351	10,592	22.38
2002–03	2,693	1,723	–	7,049	11,465	23.49
2003–04	3,218	1,678	–	7,717	12,613	25.51
2004–05	3,630	3,165	–	10,671	17,466	20.78
2005–06	4,521	1,008	3,509	15,467	24,505	18.45
2006–07	5,314	693	3,969	19,768	29,744	17.87
2007–08	6,040	834	4,453	23,891	35,218	17.15
2008–09	6,161	681	4,264	25,706	36,812	16.74
2009–10	7,044	826	2,986	23,431	34,287	20.54
2010–11	8,312	816	3,728	26,544	39,400	21.10
2011–12	8,921	1,031	4,280	28,965	43,197	20.65

It may be noted that IEs have been filing nearly 30% of the total Indian applications prior to 1995 and this proportion has gradually lowered down to nearly 20% in the past two decades. That means India has continuously remained a favourite filing destination for non-Indian entities (NIEs) right from the beginning. Impact of such a changing scenario for IEs will be their gradual dependence on NIEs.

India had been a protected market till 1980s. During the period, it has been influenced greatly by following slogans that have appeared to be attractive and patriotic, but have inculcated many IP myths and are therefore a hindrance to the growth in technology:

(i) Publish or perish: This slogan has been extremely popular for last 60 years. We destroy novelty of our inventions prematurely in a quest for publication.
(ii) Self reliance/indigenization: We have remained infringers of IP rights held by others.
(iii) Patent and commercialize: Mere holding patent rights does not permit us to commercialize our own patents.

We need to read the definition of patent rights the way it is written in the Act and learn to practice it.

With the opening up of the Indian economy in 1991, the country has witnessed entry of NIEs that have invested heavily and set up even R&D centres in India. It has been estimated that India has been home to about 800 R&D centres employing about 2 lakh qualified scientists and engineers, set up by NIEs during the past decade. NIEs perceive India as a market and therefore to maintain their monopoly positions will take all the required steps to enforce their IP rights. This aspect is not fully understood and appreciated by the IEs. Litigations are round the corner.

Worldwide, non-practising entities (NPEs) are notorious for their litigation-related activities with a view to enforce their IP rights. Such NPEs normally hoard the IP rights, but keep a watch on different sectors of industries to identify their prey. Their activities appear to be in order because they tend to exclude others from practising the inventions which are under their custody. In India, however, these NPEs are in the IP acquisition mode and have visited many educational institutions to virtually buy out the inventions at a cheap price. Their strategy to organize innovation competitions is to obtain assignments of all the invention entries in their favour at virtually no cost.

Patent applications have been prepared internally mostly by the inventors themselves. IEs believe that their inventors are skilled and knowledgeable. Indian attorneys receive almost readymade applications and think that there is hardly anything to be done[6–8], even though we have now come across a useful article[9]. They file such applications straightway to the Indian Patent Office and send to their associates for filing at other foreign patent offices. Most of the filing till early 1990s by IEs was in India only, where the allowance has been observed to be far easier. This makes IEs also believe that their attorneys are also skilled and knowledgeable. Every actor in this work chain has been extremely happy because no questions were ever asked. However, it was certainly believed that Indian patents are not as valuable as an US/EP patent.

Table 2. Data on patent applications filed for 2012 (ref. 11)

Country	Patent applications by native entities	Patent applications by non-native entities	Total filing	Percentage of filing by native entities	Percentage of filing by India compared to other countries
Australia	2,627	23,731	26,358	9.97	166.76
Brazil	4,804	25,132	29,936	15.95	146.83
Canada	4,709	30,533	35,242	13.36	124.72
China	535,313	117,464	652,777	82.01	6.73
France	14,540	2,092	16,632	87.42	264.28
Germany	46,620	14,720	61,340	76.00	71.67
India	9,553	34,402	43,955	21.73	100
Japan	287,013	55,783	342,796	83.72	12.82
Korea	148,136	40,779	188,915	78.41	23.27
Russia	28,701	15,510	44,211	64.92	99.42
UK	15,370	7,865	23,235	66.15	189.18
USA	268,782	274,033	542,815	49.52	8.10

Despite difficult economic conditions, international patent filings under the WIPO-administered Patent Co-operation Treaty (PCT) set a new record in 2011 with 181,900 applications – a growth of 10.7% on 2010 and the fastest growth since 2005 (ref. 10).

India is a developing nation even in Asia, as seen by the data for the year 2012 on patent creation by 12 different leading nations (Table 2)[11], selected from the list of BRICS, European and Asian nations and USA as well as analysing them further with respect to filing by native entities. Following trends can be seen:

(i) India filing of patent applications is higher only with respect to Australia, Brazil, Canada, France and UK and is almost at par with Russia, but lower than Germany. Filing by native entities in Australia, Brazil and Canada is about 10–15% of total filing in their respective jurisdictions. However, filing by native entities in France, Germany, UK and Russia account for 65–85% of total filing.

(ii) India filing of patent applications is substantially lower with respect to USA and other Asian nations such as China, Japan and Korea, as the respective figures are nearly 8.1%, 6.7%, 12.8% and 23.3%. Filing by native entities in China, Japan and Korea is about 78–84% of total filing in their respective jurisdictions and is way above to the similar figures for USA and India, where filing by native entities is 49.5% and 21.7% of total filing in their respective jurisdictions.

(iii) Further, filing by non-native entities in India, though larger than filing by non-native entities in Australia, Brazil, Canada, Germany and Russia, is lower than filing by non-native entities in Korea, Japan, China and USA.

We will not be concerned with either the patent creation activities or the filing by native entities for Australia, Brazil and Canada. What we will be concerned is that Asian nations such as China, Japan and Korea display a comparable patent creation activity relative to USA. Further, proportion of filing by native entities in China, Japan and Korea is higher than filing by native entities in even countries such as France, Germany, UK and Russia are much higher than in USA and India.

India looks like a developing nation even in Asia. In due course of time, IEs will be required to take license from NIEs for their survival even in India. The situation in China, Japan and Korea will just be the reverse, where the native entities will be granting the license to the entering non-native entities. Apparently, this scenario has become possible on account of a vibrant IP ambience in countries such as China, Japan and Korea, which are now the major filing destinations in the World.

Further, analysis of data on patent grants for 2012 (Table 3)[12] shows similar trends and gives the efficiency of the patent prosecution by the Patent Offices across these nations. USPTO is the fastest, as far as patent prosecution is concerned. Patent Offices in Asian nations China, Japan and Korea appear to possess similar pace as that of USPTO. Only Brazil appears to be slower than India as far as prosecution capability is seen. Other countries are much faster than India.

No wonder, USPTO, EPO, SIPO, JPO and KPO have volunteered to provide the lead in harmonizing the patent office practices and are collectively called as IP5 Office[13].

Examining the preparedness of IEs

IEs file patent applications through their patent agents/attorneys in India. And, if they have to file their patent applications in foreign countries, they do so through the same Indian patent agents/attorneys who have their associates in foreign countries. Further, the entry to foreign countries can be done in two ways. One is through the Paris Convention route that enables filing in foreign countries within one year of the original filing. The second is through the PCT route[14] that allows such entry

Table 3. Data on patent grants for 2012 (ref. 12)

Country	Patent grants to native entities	Patent grants to non-native entities	Total grants	Percentage of grants to native entities	Percentage of India grant compared to other countries
Australia	1,311	16,413	17,724	7.40	24.42
Brazil	365	2,465	2,830	12.90	152.93
Canada	2,404	19,415	21,819	11.02	19.84
China	143,808	73,297	217,105	66.24	1.99
France	11,417	1,496	12,913	88.41	33.52
Germany	8,164	3,168	11,332	72.04	38.19
India	722	3,606	4,328	16.68	100
Japan	224,917	49,874	274,791	81.85	1.58
Korea	84,061	29,406	113,467	74.08	3.81
Russia	22,481	10,399	32,880	68.37	13.16
UK	2,974	3,890	6,864	43.33	63.05
USA	121,026	132,129	253,155	47.81	1.71

within 30 months of original filing. In recent years, the PCT route is getting more popular because of inherent advantages present that enable a more scientific basis for decision-making:

(i) The system enables the patentee time that is sufficient to decide regarding the filing destinations based on the valuation and identification of potential licensees as well as internal assessments by the patentee.
(ii) The International Search Report (ISR) released on the PCT applications enables the patentee to understand the defects that were present inherently in the application for taking further action in the matter.
(iii) Unnecessary foreign filings and the resultant expenses are avoided.

Preparedness of IEs in general and that by India's elite institutions such as Indian Institutes of Technology and Indian Institute of Science (collectively known as technology creating institutions; TCIs) has been discussed. Table 4 has been generated from the data for PCT applications (taking priority date not before 1 March 2012, i.e. 2 years before 1 March 2014) filed by 'Indian Institute of' as an applicant[15–31]. The timeline has been chosen to allow the applicants decide about filing of national phase applications before 1 September 2014.

It may be observed that International Search Authority (ISA) has considered classification of subject matter, fields searched (classification system followed by classification symbols), documentation searched other than minimum documentation to the extent that such documents are included in the fields searched and electronic database consulted during the international search (name of database and wherever practicable search terms used) while conducting the search for patentability of the applications. It may be noted that *X* and *Y* represent documents of particular relevance and suggest that (i) in case of *X*, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone and (ii) in case of *Y*, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

It may be seen that the applications are from the areas of solar collectors, nanotechnology, chemical engineering, telecommunications, biotechnology, polymer science, mechanical engineering and chemistry. Further, the TCIs have employed the services of leading IP firms for this filing. However, this filing is too less considering the actual potential of these TCIs and nearly 90% of the applications lack novelty and inventive steps, as the ISA was able to determine the closest prior arts that were questioning the novelty and inventive steps of the application more often.

Considering the fact that the inventors were the students and the faculty from TCIs and had employed the services of leading Indian IP firms for handling their applications, the health of these applications raised many more questions than they answered:

(i) It is not known whether any revenue has been generated and/or any business potential will have been determined for filing any national phase applications.
(ii) It surprises us as to why the filing has been from only few technology areas. The number of PCT applications filed is very low. This number needs to be enhanced. Further, how the filing destinations are decided needs to be addressed.
(iii) It is also not clear as to why no patentability analysis was ever made on the invention disclosures. Further, why is it that the attorneys are not made responsible for their drafting skills? Dependence on the inventors for the drafting of patent applications is too risky.

Table 4. Patentscope searched for PCT applications from technology creating institutions[15]

Sl. no.	PCT application no. dated …….. from …….. dated …… (name of IP firm)	Title	Prior art (as cited by International Search Authority) hitting the novelty or inventive step in Claims (given herein) of the application
IITB 1	PCT/IN2012/000570 dated 28.08.2012 from 1993/MUM/2012 dated 10.07.2012 (Khaitan & Co.)	Method and apparatus for optimizing and scaling control plane traffic in carrier ethernet transport networks	2Ys: 1-21; Y: 5-6,11-12,17-21; Y: 6, 12, 18; 2Ys: 19-21 (ISA: USPTO); details in ref. 16
IITB 2	PCT/IN2013/000366 dated 10.06.2013 from 1715/MUM/2012 dated 13.06.2012 (Brain League)	Switched capacitor DC–DC converter-based distributed maximum power-point tracking of partially shaded photovoltaic arrays	2Ys: 1-21; Y: 3,7, 14, 18; (ISA: USPTO); details in ref. 17
IITB 3	PCT/IN2013/000180 dated 19.03.2013 from 712/MUM/2012 dated 19.03.2012 (SOLOMON & ROY)	A method to reduce end defects in rolling of sections	X: 1, 4-7; 2Ys: 2, 3; with regard to the abstract, the text has been established, according to rule 38.2,...; (ISA: USPTO); details in ref. 18
IITM 1	PCT/IB2013/055311 dated 28.06.2013 from 2753/CHE/2012 dated 07.07.2012 (Lex Orbis)	Metal nanoparticle–graphene composites and methods for their preparation and use	X: 1-6; X: 18, 20-23; Y: 7-12; Y: 19, 24-29; Y: 8-17, 19, 25, 27-29; Y: 24-29; Y: 7-17; Y: 7; Y: 8-17 (ISA: USPTO); details in ref. 19
IITM 2	PCT/IB2013/050144 dated 08.01.2013 from 2468/CHE/2012 dated 21.06.2012 (Lex Orbis)	Graphene functionalized carbon nanotube polymer composites and methods for their preparation and use	X: 1-3, 14, 17, 18; 2Ys: 15, 16, 26-28 (ISA: USPTO); details in ref. 20
IITM 3	PCT/IB2013/053127 dated 20.04.2013 from 2237/CHE/2012 dated 04.06.2012 (Lex Orbis)	Progressive cavity pump	With regard to the abstract, the text has been established, according to rule 38.2,...; (ISA: Australia Patent Office); details in ref. 21
IITM 4	PCT/IB2012/001518 dated 07.08.2012 from 2097/CHE/2012 dated 25.05.2012 (Lex Orbis)	Luminescent graphene patterns	X: 14, 16; Y: 3, 8-13, 15, 19, 24, 37, 42; 2 Ys: 1-8, 17-24, 32-42; Y: 2, 4-13, 15, 18, 20-24, 36, 38-42; Y: 9-13; Y: 17-24, 32-42; Y: 32; Y: 34; Claim No. 25-31 are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4 (a) (ISA: USPTO); details in ref. 22
IITM 5	PCT/IB2012/001523 dated 08.08.2012 from1646/CHE/2012 dated 26.04.2012 (Lex Orbis)	Metal-alloy graphene nanocomposites and methods for their preparation and use	X: 17, 22, 25; Y: 1-16, 18-21, 23, 24, 26-38; Y: 4, 5, 23, 24, 26-38; Y: 37, 38; 2Ys: 1-16, 18-21, 34-36; Y: 6-8, 11-16; 2Ys: 35, 36; (ISA: USPTO); details in ref. 23
IITM 6	PCT/IN2013/000199 dated 26.03.2013 from 1542/CHE/2012 dated 18.04.2012 (MOHAN ASSOCIATES)	A process for the preparation of the core structure in quinolone and napthyridone class of antibiotics	X: 1-11; 4Xs: 1,2; (ISA: EPO); details in ref. 24
IITM 7	PCT/IB2013/001244 dated 17.04.2013 from 1521/CHE/2012 dated 17.04.2012	Detection of quantity of water flow using quantum clusters	7Ys: 1-22; Y: 5-9, 11, 15; (ISA: EPO); details in ref. 25
IITD 1	PCT/IN2013/000347 dated 31.05.2013 from 1669/DEL/2012 dated 31.05.2012 (A&A)	A system for generating refreshable tactile text and graphics	X: 1-19; Claims 20-22 do not comply with Rule 6.2 (a) because they rely on references to the description and drawings; (ISA: Australia Patent Office); details in ref. 26
IITK 1	PCT/IB2013/054943 dated 17.06.2013 from 1858/DEL/2012 dated 18.06.2012 (K & S Partners)	Systems and methods for dry processing fabrication of binary masks with arbitrary shapes for ultraviolet laser micromachining	2Ys: 1-96; Y: 1-47, 52-54, 58, 72, 73; Y: 19-21, 67-69; Y: 29-35, 37-40, 77-83; Y: 45-47, 94-96 (ISA: USPTO); details in ref. 27
IITK 2	PCT/IB2013/053011 dated 16.04.2013 from 1301/DEL/2012 dated 27.04.2012 (K&S Partners)	System for characterizing focused charged beams	X: 1-4, 6, 7, 10, 12-14, 16, 20-23, 25, 26, 28, 29; Y: 5, 8, 9, 11, 15, 17-19, 24, 27, 30; Y: 5, 17, 27; Y: 8, 19, 24; Y: 9; Y: 11; Y: 15, 30; Y: 18; With regard to the title, the text has been established by the Authority; (ISA: USPTO); details in ref. 28
IITK 3	PCT/IN2013/000254 dated 17.04.2013 from 1180/DEL/2012 dated 17.04.2012 (Rajeshwari & Associates)	A method of measuring bmp signalling using bmp responsive reporter cell line	X: 1, 2, 4, 7-9; X: 1-12; 2Ys: 3, 10; Claim No. 13-18 are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4 (a) (ISA: USPTO); details in ref. 29
IISc 1	PCT/IB2013/051798 dated 07.03.2013 from 2713/CHE/2012 dated 04.07.2012 (K&S Partners)	Compounds as inhibitor of DNA double-strand break repair, methods and applications thereof	2Xs: 1-4, 18-20; X: 1-13, 15-17; 2Ys: 14, 16: Claim No. 21-24 are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4 (a) (ISA: USPTO); details in ref. 30
IISc 2	PCT/IN2012/000387 dated 04.06.2012 from 900/CHE/2012 dated 09.03.2012 (L&S)	Nickel–aluminium–zirconium alloys	(ISA: Australia Patent Office); details in ref. 31

Creating the solutions

The 21st century has emerged as an era of IP awakening in India. IP professionals in India have now started discussing at various forums issues like infringements, prosecution at foreign patent offices such as USPTO/EPO, attack by IP trolls, enforceability of IP rights, patentability, freedom to operate (FTO), etc. Even innovation firms such as Crafitti[32] have come forward to educate IEs about the strategies to prepare robust invention disclosures.

India requires massive turn around options to create vibrant IP society in almost every sector for its visibility:

(i) Academia has a vital role to spearhead this movement in India at a much faster pace. Our children are taught almost every subject on this Earth even at the primary level. They are already heavily loaded. With proper planning it should be possible to prune their workload and introduce only the relevant subjects, including IP. Introduction of IP subjects at University level may create IP leaders in a short duration, but it will be too little, too late. Ultimately this passion for IP has to be inculcated at a young age so that children learn to look around for inventions and innovations before it is too late.

(ii) IEs must be cautious in the matters of publishing their research results. It is always a better idea to examine such a publication for the presence of any patentable invention in order to protect them before moving ahead for the publication.

(iii) IEs must stay away from the infringements and therefore must understand their obligations if they have signed any secrecy agreement with any party. That will enable them ask others to stay away from infringing their inventions.

(iv) IEs must go for a freedom to operate search before they launch a product in the market. Such a search will enable them identify the potential entities that should be approached to seek a proper license. Further, this will take them away from the costly litigations. Paradigm shift in IP awareness and the IP regime from 'live and let others live…with copying' to 'live and let others live…without copying', is therefore the need of the day.

IEs generally employ technocrats to look into their IP-related activities. These technocrats generally function as coordinators between their inventors and the attorneys. In due course of time, they get adequate knowledge and awareness about the IP issues. If they are not clear about their role, they should not hesitate to connect themselves with their peers. Their objective should be to help the IEs and therefore they should not be seen as an IP professional trying to help the other IP professionals in law firms. Such IP professionals should:

(i) Be looking for IP role models and sign the appropriate MOUs with such organizations.

(ii) Be always searching for the competent IP firms that can provide their services at economical rates.

(iii) Undertake only those tasks internally that they are able to perform with aplomb and outsource rest of the IP work to skilled and competent IP firms.

(iv) Develop the skills to screen the proposed publications for the presence of invention and copyright infringements.

(v) Ensure that their inventors have adequate IP awareness levels so that they are able to spot the inventions at their workplace and do not deliberately infringe any IP rights held by others.

Still it is not very late for IEs to adopt correct IP practices in order to stay away from the IP infringements and avoid the costly litigations. Academia can become training schools for the IEs and therefore can introduce IP awareness programmes to inculcate passion for IP issues. Academia prepares the qualified manpower, functions as the knowledge powerhouse and creates IP at its research laboratories. However, generation of revenue from such created IP is doubtful in the absence of a fully functional IP Cell.

IP goals of an organization must therefore include a proactive approach towards protecting its IP, clearance of its products, besides integration of product development process into patent filing, a watch on competitors or licensee's patent filings, filing blocking patents as appropriate and identification of any problem patents early in the design process:

(i) A patent owner must teach others how to make and use the invention in order to get the patent. Patent owner will be at great risk by not patenting the invention, i.e. trying to keep it a trade secret, as someone else can patent it and exclude him from using it.

(ii) At times, it is also important for the organization to create fencing for their inventions whereby possible infringers are not in a position to design around the inventions.

(iii) Valuation of inventions enables us to know the value of the invention and eases the decision for filing and retaining or discarding the inventions. Potential licensees can be determined to decide for the filing destinations, renewal of existing inventions besides initiating dialogue with licensees.

(iv) As the commercialization by self is not accounted for in the books, the organization remains unaware about the value of its own inventions. The licensing of an invention is often overlooked in the absence of a proper networking and proper motivation for the licensees.

(v) In a country like India, where the infringement of the patents is quite rampant and patent litigations are

still in their formative stages, the infringements are often difficult to detect at the first instance. However, once the infringements are detected, the organization must develop the skills and courage to enforce its inventions.

(vi) A regular IP watch will scare any prospective infringer from making an attempt to infringe an invention. Such an exercise invigorates the whole business scenario and brings out a sense of responsibility amidst the various players. Periodic IP watch will help patentees keep a check on the infringements. Further, it should be ensured that patentees do not infringe (copying without authorization) IP rights owned by others. That will give the patentee the moral courage to take head on the infringements that others do on their inventions.

TCIs, the premier institutions of the country, are known for their high standards in teaching and research and attract eminent scholars to their faculty:

(i) There appears to be a possibility of creating IP at different departments of TCIs by merely looking into their activities. Similarly, there could be other departments where IP can be potentially created. They need not be overlooked.

(ii) Further, it may be necessary to look into academic collaborations, consultancy projects from different industries, on-going research projects funded by different funding agencies and student projects at different locations in order to analyse the IP that has been missed out and to understand the reasons behind it so as to take corrective actions for the future, at least. This calls for an IP audit at TCI just to know what is owned and what is not owned by TCI? What is jointly owned and how it is owned?

(iii) Further, it may also be necessary to estimate the size of the IP Cell that will be required to handle the total IP work created at TCI.

IP includes patents, copyrights, trademarks and designs besides the IP transactional issues arising as a result of collaborations. A separate independent IP Cell is the requirement that IE can hardly ignore. IE needs to identify trainers who can be given incentive for completing WIPO/IPO resource materials and clearing patent agent/ trademark agent examinations. Further, there can be programmes like 'training the trainers'. Mass awareness programmes on IP issues for the inventors need to be conducted.

IP Cell @ IE

IP professionals need to be appointed to look into the creation of IP (created within IE and outside arising as a result of collaborations), their registrations and maintenance besides ensuring the interests of IEs while drafting the collaboration agreements. IP Cell shall outsource, coordinate and control the IP work with competent IP firms. Creation of IP Cell has become imminent in the educational institutions, where presence of patent agents can do wonders. Such professionals can help the inventors spot the inventions and prepare the invention disclosures besides carrying out the preliminary patentability analysis and preparing responses to office action besides many other IP-related activities such as infringements and IP risk analysis, etc. A technocrat to function as a CEO may be specially appointed. Such a technocrat must have an overall ability to spearhead the IP Cell that must be supported by the Vice-Chancellor/Director, Dean and HODs and should have the support of registered patent agent(s)/ trademark agents and lawyers with knowledge of IP issues.

Many a time, the belief of the organization that their inventors know everything about their inventions is a myth. Inventors may write everything in their invention disclosure, except the invention. Inventors do require specialized training in the area of 'how to prepare invention disclosures?' Inventors are expected to carry out research, write reports, patent applications, prepare responses to office actions, provide support to the attorneys, make presentations at various levels and carry out even pilot plant and commercial plant trials besides many other miscellaneous activities that at times one is tempted to believe that he/she does everything except research.

Onus to create invention disclosures lies on inventors. They also have the responsibility of carrying out preliminary prior art search. However, the inventors lack the skills to separate out their invention from the prior art. Inventors also lack the skills to assess their invention from the patentability perspective. Inventors are often accused of hiding some part of their invention as a trade secret. When the elements of the invention are not present in prior art, the invention becomes patentable. Invention details that need to be included are:

(i) The nature and field of the invention and related applications.

(ii) A brief statement identifying the problem, what is thought to be novel in the proposed invention.

(iii) What are the problems/limitations/drawbacks of the currently available product or process.

(iv) Drawings of the device, equipment/apparatus involved as well as the process flow sheet/diagram/circuit identifying elements in the drawings should also form part of the invention details. Describe the invention in detail and identify the preferred embodiment. Try to add embodiments as much as feasible and at least one example/illustration of the invention.

(v) Describe the product first and then describe the method of working/operation or process or the process of preparation of the composition, as the case may be.

Inventors have the potential to enhance their filing by going through several brainstorming workshops where technological alternatives and design around can be exercised. Inventors should be enabled to participate in such workshops in order to prepare robust and enforceable invention disclosures and provide the required input to the attorneys for the preparation of complete applications, response to the office actions, analysis of patentability search report, FTO, etc.

The IP Cell may therefore verify the prior art search in order to ensure that only the relevant prior art has been described in the invention disclosure and the prior art has not been claimed in the invention disclosure. It may further help the inventors in separating out the invention from the prior art in order to identify whether the invention is indeed present in the invention disclosure.

So far, only India and PCT filing followed by national phase entry in different countries such as USA and Europe has been the strategy followed by IEs. Some experience seems to have been gained. However, the issues pertaining to prosecution at different patent offices merit consideration. Further:

(i) Do the inventors remain with IEs? What about ownership issues on these inventions? How do they keep a watch on the past inventors for the purpose of coordinating with them? How do they assure the confidentiality issues? Whether any reward scheme for the inventors is in force at IEs?
(ii) It may be recalled that these applications were filed through attorneys. Has anybody advised them to file requests for their examinations? Who at IE is maintaining the timelines?
(iii) What about exploring other foreign nations? Who will do that? What about other tasks?
(iv) Who will handle the issues related to copyrights, trademarks, designs and other IPs?
(v) What about their commercialization opportunities to earn the revenue?
(vi) Has IE ever been accused on account of any infringement issues?

It is to be appreciated that the activities conducted by the IP Cell will require interaction with inventors. Whether they require any help and financial assistance during the preparation of invention disclosures, needs to be ascertained. Interaction with attorneys is no less important. Making payments to them in time will keep the work moving. Ideally, it should be possible to see the IP Cell converting an IE from cost centre to profit centre. Further, IP Cell will need to work internally with the finance department of IE as well to obtain financial concurrence before securing approval from the competent authority prior to award of the work to the attorney. As the estimates provided initially by the attorney are only tentative, it may therefore be necessary to seek additional approvals in order to ensure the timely completion of the work.

Besides supervision over the quality, pace and accuracy of the deliverables by the attorneys need to be checked by the IP Cell. If this is not done meticulously, every effort in creating the IP Cell will go waste. It is therefore absolutely essential to bind the attorney through an agreement for the confidentiality, quality levels and even incorporate penalty clauses in the agreement for their negligent acts. Attorneys need not be paid any money in advance. It may be prudent to keep a panel of IP attorneys for a fixed duration of 5 years and obtain from them some sort of cost fixation for the services they render. They cannot be allowed to bill as they like. This is an important aspect because the IP firms have a tendency to raise the cost at periodic intervals. And such cost rises may not relate to price-index always.

Initially, the actual work will be far less, but with time may increase substantially. Then the selection of IP firms can be done through global expression of interest and tendering amongst the shortlisted parties. That would ensure a fixed cost for the services rendered by the attorneys for a given duration.

IE may have quite a large number of affiliated divisions, PG colleges, etc. IP Cell has to keep a watch on the activities related to IP creation at these colleges and render necessary help to nurture these activities. In future, when IE has amassed a number of technologies, it can aspire to function as a technology provider and provide help to medium and small-medium enterprises (MSMEs), State and Central governments and other authorities in technology-related matters. To summarize, the role of IP Cell will be to:

(i) Exercise centralized control on inventions in order to bring uniformity and consistency and provide decentralized help to the inventors for the preparation of invention disclosures.
(ii) Be responsible for the appointment of competent attorneys to conduct prior art search, draft, file and prosecute applications in India and abroad.
(iii) Conduct IP awareness trainings at regular intervals for the different stakeholders.

Needless to mention, IP Cell shall be headed by a professionally qualified technocrat with support from IP and legal professionals. IP Cell shall also keep track of IE inventors till the applications are granted, besides keeping track of the applications till they are granted and even technically contributing in the preparation of invention disclosures and responses to office actions and supervizing the quality of the deliverables provided by outside IP firms.

There could be innovation firms to enhance the pace of creating invention disclosures. Not many innovation firms exist in India anyway. However, Crafitti is one firm

that has achieved the real results working with inventors from companies in fast moving consumer goods, electronics, auto and petroleum sectors and has embarked upon a programme to prepare 'certified innovation co-crafters'.

Jobs at IP firms

India filing by NIEs constitutes 80% of total India filings that are handled by Indian IP firms. These applications are essentially national-phase applications that originate from PCT applications prepared and filed in foreign jurisdictions. Working with IEs will only educate these Indian IP firms about the challenges faced in reading invention disclosures, preparation of robust and enforceable applications, besides various infringement-related litigation issues. The focus of Indian IP firms should be litigation avoidance strategy rather than driving the IEs towards litigation. Indian IP firms need to reorient their strategy to help IEs become IP conscious. Attorneys have to verify the prior art search and conduct patentability analysis for provisional application. If patentable, attorneys have to proceed for drafting and ensure that no prior art is claimed. If non-patentable, they have to design around prior to drafting. They also have to conduct the patentability analysis for the complete specification prior to filing.

Conclusion

Technology comprises of at least three important IP types and understanding with respect to their creation is an important aspect, where institutional support in today's context is a necessity. Myths and challenges facing the academia, inventors and IP professionals in academia and IP firms have been explained. IEs need to enhance their pace of creating invention disclosures and should therefore take help of innovators to attain this objective. Further, they must understand the strategy of NPEs that are busy buying out the invention disclosures at various academias. IEs have been advised to adopt correct IP practices to avoid infringements, besides staying away from IP myths.

Based on the PCT applications filed by IEs, the gap areas in creating robust invention disclosures have been identified and the creation of a fully functional IP Cell at IE has been recommended. Such an IP Cell will be required to help the inventors identify their inventions and ensure that the attorneys have also understood the inventions before they attempt to carry out patentability analysis and do the drafting and attend the prosecution without any confusion. TTO can be a subsequent possibility after successful operation of IP Cell so as to get engaged in the transactions-related issues for the technologies created at IE.

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